

IN THE CLAIMS

1. (Currently Amended) A capacitor, comprising:
a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the first electrode and the second electrode; and
a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and one of the first and second electrodes.
2. (Original) The capacitor according to claim 1, wherein the one electrode is a tungsten nitride and the buffer layer is a tungsten oxide.
3. (Original) The capacitor according to claim 2, wherein the dielectric layer is a tantalum oxide.
4. (Original) The capacitor according to claim 1, wherein the buffer layer has a orthorhomic crystalline structure.
5. (Currently Amended) A capacitor, comprising:
a first electrode;
a second electrode;
a dielectric layer interposed between the first electrode and the second electrode; and
a tungsten trioxide buffer layer interposed between and directly adjoining the dielectric layer and one of the first and second electrodes.
6. (Original) The capacitor according to claim 5, wherein the buffer layer has a orthorhomic crystalline structure.
7. (Original) The capacitor according to claim 5, wherein the one electrode includes tungsten.

8. (Original) The capacitor according to claim 7, wherein the buffer layer is grown by oxidizing the one electrode.
9. (Currently Amended) A capacitor, comprising:
 - a first electrode;
 - a second electrode;
 - a single compound, dielectric layer interposed between the first electrode and the second electrode; and
 - a metal oxide buffer layer interposed between and directly adjoining the dielectric layer and one of the first and second electrodes, wherein the metal oxide buffer layer includes a refractory metal.
10. (Original) The capacitor according to claim 9, wherein the buffer layer is of the formula MO_x , and M is a metal component from a group consisting of tungsten, tantalum, zirconium, and hafnium.
11. (Original) The capacitor according to claim 9, wherein the buffer layer has a orthorhombic crystalline structure.
12. (Currently Amended) A vertical capacitor, comprising:
 - a bottom electrode;
 - a top electrode positioned above the bottom electrode;
 - a single compound, dielectric layer interposed between the top electrode and the bottom electrode; and
 - a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and the bottom electrode.
13. (Original) The capacitor according to claim 12, wherein the bottom electrode is a tungsten nitride and the buffer layer is a tungsten oxide.

14. (Original) The capacitor according to claim 13, wherein the dielectric layer is a tantalum oxide.
15. (Original) The capacitor according to claim 12, wherein the buffer layer has a orthorhomic crystalline structure.
16. (Currently Amended) A capacitor, comprising:
a bottom electrode;
a top electrode;
a single compound, dielectric layer interposed between the top electrode and the bottom electrode; and
a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and the bottom electrode, wherein the metal in the buffer layer is a refractory metal.
17. (Original) The capacitor according to claim 16, wherein the metal in the buffer layer is tungsten.
18. (Original) The capacitor according to claim 17, wherein the bottom electrode comprises a metal nitride, and the metal in the bottom electrode is a refractory metal.
19. (Original) The capacitor according to claim 18, wherein the bottom electrode comprises tungsten nitride.
20. (Currently Amended) A capacitor, comprising:
a bottom electrode;
a top electrode;
a single compound, dielectric layer interposed between the top electrode and the bottom electrode; and

a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and the bottom electrode, wherein the bottom electrode comprises a metal nitride having a metal component which is the same as the metal component of the metal oxide buffer layer.

21. (Original) The capacitor according to claim 20, wherein the dielectric layer comprises tantalum oxide.
22. (Original) The capacitor according to claim 21, wherein the metal component of the bottom electrode and the buffer layer includes tungsten.
23. (Currently Amended) A capacitor, comprising:
a bottom electrode;
a top electrode;
a single compound, dielectric layer interposed between the bottom electrode and the top electrode; and
at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the bottom electrode and the top electrode;
wherein at least one electrode selected from the group consisting of the bottom electrode and the top electrode comprises tungsten nitride.
24. (Original) The capacitor according to claim 23, wherein the dielectric layer is a metal oxide of a different type than the buffer layer.
25. (Currently Amended) A capacitor, comprising:
a first electrode;
a second electrode;
a single compound, tantalum oxide dielectric layer interposed between the bottom electrode and the top electrode; and

at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the bottom electrode and the top electrode;

wherein at least one electrode is selected from the group consisting of the bottom electrode and the top electrode includes tungsten nitride.

26. (Currently Amended) A capacitor, comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and one of the first and second electrodes, wherein the metal oxide buffer layer has an ~~orthorhombic~~ orthorhombic crystal structure.

27. (Original) The capacitor according to claim 26, wherein the metal in the buffer layer is tungsten.

28. (Currently Amended) A capacitor, comprising:

a bottom electrode;

a top electrode;

a single compound, dielectric layer interposed between the top electrode and the bottom electrode; and

an annealed metal oxide buffer layer intermediate and directly adjoining the dielectric layer and the bottom electrode.

29. (Original) The capacitor according to claim 28, wherein the bottom electrode comprises a metal nitride and has a metal component which is the same as the metal component of the metal oxide buffer layer.

30. (Currently Amended) A capacitor, comprising:
- a first electrode;
 - a second electrode;
 - a single compound, dielectric layer interposed between the first electrode and the second electrode; and
 - a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and one of the first and second electrodes;
- wherein the buffer layer has a dielectric constant greater than the dielectric layer.
31. (Original) The capacitor according to claim 30, wherein the one of the first and second electrodes has a metal component which is the same as the metal component of the buffer layer.
32. (Original) The capacitor according to claim 30, wherein the buffer layer has an orthorhombic crystalline structure.
33. - 72. (Previously Withdrawn)
73. (Currently Amended) A semiconductor die, comprising:
- an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:
- a first electrode;
 - a second electrode;
 - a single compound, dielectric layer interposed between the first electrode and the second electrode; and
- at least one metal oxide buffer layer interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode.

74. (Currently Amended) A semiconductor die, comprising:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode.

75. (Currently Amended) A semiconductor die, comprising:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, metal oxide dielectric layer interposed between the first electrode and the second electrode; and

at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;

wherein at least one electrode selected from the group consisting of the first electrode and the second electrode comprises tungsten nitride.

76. (Currently Amended) A semiconductor die, comprising:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;
a tungsten nitride second electrode;
a single compound, metal oxide dielectric layer interposed between the first electrode and the second electrode; and
a tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and the second electrode.

77. (Currently Amended) A semiconductor die, comprising:
an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;
a tungsten nitride second electrode;
a single compound, metal oxide dielectric layer interposed between the first electrode and the second electrode; and
a high temperature annealed, tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and the second electrode.

78. (Original) The semiconductor die according to claim 77, wherein the high temperature annealed buffer layer is annealed at least 700 degrees Celsius and has an orthorhombic crystal structure.

79. (Currently Amended) A semiconductor die, comprising:
an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:
a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the first electrode and the second electrode; and

a metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and the second electrode, wherein the buffer layer has an ~~orthorhombic~~ orthorhombic crystal lattice structure.

80. (Currently Amended) A semiconductor die, comprising:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

a metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and the second electrode,

wherein the buffer layer has a dielectric constant greater than the dielectric layer.

81. (Currently Amended) A memory device, comprising:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one metal oxide buffer layer interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;

a row access circuit coupled to the array of memory cells;

a column access circuit coupled to the array of memory cells; and

an address decoder circuit coupled to the row access circuit and the column access circuit.

82. (Original) The memory device according to claim 81, wherein the electrode selected from the group consisting of the first electrode and the second electrode has a metal component that is the same as the metal component of the buffer layer.

83. (Currently Amended) A memory device, comprising:
an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

- a first electrode;
- a second electrode;
- a single compound, dielectric layer interposed between the first electrode and the second electrode; and
- at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;
- a row access circuit coupled to the array of memory cells;
- a column access circuit coupled to the array of memory cells; and
- an address decoder circuit coupled to the row access circuit and the column access circuit.

84. (Currently Amended) A memory device, comprising:
an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

- a first electrode;
- a second electrode;
- a single compound, metal oxide dielectric layer interposed between the first electrode and the second electrode; and

at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode, wherein at least one electrode selected from the group consisting of the bottom electrode of the capacitor and the top electrode of the capacitor comprises tungsten nitride;

a row access circuit coupled to the array of memory cells;
a column access circuit coupled to the array of memory cells; and
an address decoder circuit coupled to the row access circuit and the column access circuit.

85. (Currently Amended) A memory device, comprising:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one metal oxide buffer layer interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode, the buffer layer having an ~~orthorhombic~~ orthorhombic crystalline structure;

a row access circuit coupled to the array of memory cells;
a column access circuit coupled to the array of memory cells; and
an address decoder circuit coupled to the row access circuit and the column access circuit.

86. (Currently Amended) A memory device, comprising:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;

a second electrode;
a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one metal oxide buffer layer interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode, the buffer layer having a dielectric constant greater than the dielectric layer;

a row access circuit coupled to the array of memory cells;
a column access circuit coupled to the array of memory cells; and
an address decoder circuit coupled to the row access circuit and the column access circuit.

87. (Currently Amended) A memory device, comprising:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one, high temperature annealed, metal oxide buffer layer interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;

a row access circuit coupled to the array of memory cells;
a column access circuit coupled to the array of memory cells; and
an address decoder circuit coupled to the row access circuit and the column access circuit.

88. (Currently Amended) A memory module, comprising:

a support;
a plurality of leads extending from the support;

a command link coupled to at least one of the plurality of leads;
a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and
at least one memory device contained on the support and coupled to the command link, wherein the at least one memory device comprises:
an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:
a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the first electrode and the second electrode; and
at least one metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;
a row access circuit coupled to the array of memory cells;
a column access circuit coupled to the array of memory cells; and
an address decoder circuit coupled to the row access circuit and the column access circuit.

89. (Original) The module according to claim 88, wherein the electrode selected from the group consisting of the first electrode and the second electrode includes a metal component that is the same as the metal component of the buffer layer.

90. (Currently Amended) A memory module, comprising:
a support;
a plurality of leads extending from the support;
a command link coupled to at least one of the plurality of leads;
a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and

at least one memory device contained on the support and coupled to the command link,
wherein the at least one memory device comprises:

an array of memory cells, wherein at least one memory cell has a
capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the
first electrode and the second electrode; and

at least one tungsten oxide buffer layer, wherein each
tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and
an electrode selected from the group consisting of the ~~bottom~~ first electrode and the ~~top~~ second
electrode;

a row access circuit coupled to the array of memory cells;

a column access circuit coupled to the array of memory cells; and

an address decoder circuit coupled to the row access circuit and the
column access circuit.

91. (Currently Amended) A memory module, comprising:

a support;

a plurality of leads extending from the support;

a command link coupled to at least one of the plurality of leads;

a plurality of data links, wherein each data link is coupled to at least one of the plurality
of leads; and

at least one memory device contained on the support and coupled to the command link,
wherein the at least one memory device comprises:

an array of memory cells, wherein at least one memory cell has a
capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, metal oxide dielectric layer interposed between the first electrode and the second electrode; and

at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode, the buffer layer having a dielectric constant greater than the dielectric layer;

a row access circuit coupled to the array of memory cells;

a column access circuit coupled to the array of memory cells; and

an address decoder circuit coupled to the row access circuit and the column access circuit wherein at least one electrode selected from the group consisting of the bottom electrode of the capacitor and the top electrode of the capacitor comprises tungsten nitride.

92. (Currently Amended) A memory module, comprising:

a support;

a plurality of leads extending from the support;

a command link coupled to at least one of the plurality of leads;

a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and

at least one memory device contained on the support and coupled to the command link, wherein the at least one memory device comprises:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an

electrode selected from the group consisting of the first electrode and the second electrode, the buffer layer having an ~~orthorhombic~~ orthorhombic crystalline structure;

a row access circuit coupled to the array of memory cells;

a column access circuit coupled to the array of memory cells; and

an address decoder circuit coupled to the row access circuit and the column access circuit.

93. (Currently Amended) A memory module, comprising:

a support;

a plurality of leads extending from the support;

a command link coupled to at least one of the plurality of leads;

a plurality of data links, wherein each data link is coupled to at least one of the plurality of leads; and

at least one memory device contained on the support and coupled to the command link, wherein the at least one memory device comprises:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one, high temperature annealed metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;

a row access circuit coupled to the array of memory cells;

a column access circuit coupled to the array of memory cells; and

an address decoder circuit coupled to the row access circuit and the column access circuit.

94. (Currently Amended) A memory system, comprising:
- a controller;
 - a command link coupled to the controller;
 - a data link coupled to the controller; and
 - a memory device coupled to the command link and the data link, wherein the memory device comprises:
 - an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:
 - a first electrode;
 - a second electrode;
 - a single compound, dielectric layer interposed between the first electrode and the second electrode; and
 - at least one metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;
 - a row access circuit coupled to the array of memory cells;
 - a column access circuit coupled to the array of memory cells; and
 - an address decoder circuit coupled to the row access circuit and the column access circuit.
95. (Original) The system according to claim 94, wherein the electrode selected from the group consisting of the first electrode and the second electrode includes a metal component that is the same as the metal component of the buffer layer.
96. (Currently Amended) A memory system, comprising:
- a controller;
 - a command link coupled to the controller;
 - a data link coupled to the controller; and
 - a memory device coupled to the command link and the data link, wherein the memory device comprises:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;

a row access circuit coupled to the array of memory cells;

a column access circuit coupled to the array of memory cells; and

an address decoder circuit coupled to the row access circuit and the column access circuit.

97. (Currently Amended) A memory system, comprising:

a controller;

a command link coupled to the controller;

a data link coupled to the controller; and

a memory device coupled to the command link and the data link, wherein the memory device comprises:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode, the buffer layer having an ~~orthorhombic~~ orthorhombic crystalline structure;

a row access circuit coupled to the array of memory cells;
a column access circuit coupled to the array of memory cells; and
an address decoder circuit coupled to the row access circuit and the
column access circuit.

98. (Currently Amended) A memory system, comprising:

a controller;
a command link coupled to the controller;
a data link coupled to the controller; and
a memory device coupled to the command link and the data link, wherein the memory
device comprises:

an array of memory cells, wherein at least one memory cell has a
capacitor, the capacitor comprising:

a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the
first electrode and the second electrode; and

at least one metal oxide buffer layer, wherein each metal
oxide buffer layer is interposed between and directly adjoining the dielectric layer and an
electrode selected from the group consisting of the first electrode and the second electrode, the
buffer layer having a dielectric constant greater than the dielectric layer;

a row access circuit coupled to the array of memory cells;
a column access circuit coupled to the array of memory cells; and
an address decoder circuit coupled to the row access circuit and the
column access circuit.

99. (Currently Amended) A memory system, comprising:

a controller;
a command link coupled to the controller;
a data link coupled to the controller; and

a memory device coupled to the command link and the data link, wherein the memory device comprises:

an array of memory cells, wherein at least one memory cell has a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one high temperature annealed, metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;

a row access circuit coupled to the array of memory cells;

a column access circuit coupled to the array of memory cells; and

an address decoder circuit coupled to the row access circuit and the column access circuit.

100. (Currently Amended) An electronic system, comprising:

a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode.

101. (Original) The system according to claim 100, wherein the electrode selected from the group consisting of the first electrode and the second electrode includes a metal component that is the same as the metal component of the buffer layer.

102. (Currently Amended) An electronic system, comprising:

a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

at least one tungsten oxide buffer layer, wherein each tungsten oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode.

103. (Currently Amended) An electronic system, comprising:

a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the bottom electrode and the top electrode; and
at least one metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;
wherein the metal oxide buffer layer has an ~~orthorhombic~~ orthorhombic crystalline structure.

104. (Currently Amended) An electronic system, comprising:
a processor; and
a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:
an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:
a first electrode;
a second electrode;
a single compound, dielectric layer interposed between the bottom electrode and the top electrode; and
at least one metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode;
wherein the metal oxide buffer layer has a dielectric constant greater than the dielectric constant of the dielectric layer.

105. (Currently Amended) An electronic system, comprising:
a processor; and

a circuit module having a plurality of leads coupled to the processor, and further having a semiconductor die coupled to the plurality of leads, wherein the semiconductor die comprises:

an integrated circuit supported by a substrate and having a plurality of integrated circuit devices, wherein at least one of the plurality of integrated circuit devices comprises a capacitor, the capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the bottom electrode and the top electrode; and

at least one high temperature annealed, metal oxide buffer layer, wherein each metal oxide buffer layer is interposed between and directly adjoining the dielectric layer and an electrode selected from the group consisting of the first electrode and the second electrode.

106. (Currently Amended) A capacitor, comprising:

an annealed bottom electrode;

a top electrode;

a single compound, dielectric layer interposed between the top electrode and the bottom electrode; and

an annealed metal oxide buffer layer intermediate and directly adjoining the dielectric layer and the bottom electrode.

110. (Currently Amended) A memory cell comprising a capacitor and an access device, wherein the capacitor includes:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and one of the first and second electrodes.

111. (Original) The memory cell according to claim 110, wherein the one electrode is a tungsten nitride and the buffer layer is a tungsten oxide.

112. (Currently Amended) The memory cell according to claim 110, wherein the buffer layer has a ~~orthorhombic~~ orthorhombic crystalline structure.

113. (Currently Amended) A memory cell comprising a capacitor and an access device, wherein the capacitor includes:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

a tungsten trioxide buffer layer interposed between and directly adjoining the dielectric layer and one of the first and second electrodes.

114. (Original) The memory cell according to claim 113, wherein the one electrode includes tungsten.

115. (Original) The memory cell according to claim 114, wherein the buffer layer is grown by oxidizing the one electrode.

116. (Currently Amended) A memory cell comprising a capacitor and an access device, wherein the capacitor includes:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

a metal oxide buffer layer interposed between and directly adjoining the dielectric layer and one of the first and second electrodes, wherein the metal oxide buffer layer includes a refractory metal.

117. (Original) The memory cell according to claim 116, wherein the buffer layer is of the formula MO_x , and M is a metal component from a group consisting of tungsten, tantalum, zirconium, and hafnium.

118. (Currently Amended) A processor and a memory cell electrically connected to said processor, wherein said memory cell includes a capacitor comprising:

- a first electrode;
- a second electrode;
- a single compound, dielectric layer interposed between the first electrode and the second electrode; and

- a metal oxide buffer layer intermediate and directly adjoining the dielectric layer and one of the first and second electrodes.

119. (Original) The memory cell according to claim 118, wherein the one electrode is a tungsten nitride and the buffer layer is a tungsten oxide.

120. (Currently Amended) The memory cell according to claim 118, wherein the buffer layer has a ~~orthorhombic~~ orthorhombic crystalline structure.

121. (Currently Amended) A processor and a memory cell electrically connected to said processor, wherein said memory cell includes a capacitor comprising:

- a first electrode;
- a second electrode;
- a dielectric layer interposed between the first electrode and the second electrode; and
- a tungsten trioxide buffer layer interposed between and directly adjoining the dielectric layer and one of the first and second electrodes.

122. (Original) The memory cell according to claim 121, wherein the one electrode includes tungsten.

123. (Original) The memory cell according to claim 122, wherein the buffer layer is grown by oxidizing the one electrode.

124. (Currently Amended) A processor and a memory cell electrically connected to said processor, wherein said memory cell includes a capacitor comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode; and

a metal oxide buffer layer interposed between and directly adjoining the dielectric layer and one of the first and second electrodes, wherein the metal oxide buffer layer includes a refractory metal.

125. (Original) The memory cell according to claim 124, wherein the buffer layer is of the formula MO_x, and M is a metal component from a group consisting of tungsten, tantalum, zirconium, and hafnium.

126. (Currently Amended) [The capacitor of claim 1,] A capacitor, comprising:

a first electrode;

a second electrode;

a single compound, dielectric layer interposed between the first electrode and the second electrode;

a metal oxide buffer layer intermediate the dielectric layer and one of the first and second electrodes; and

wherein the dielectric layer directly adjoins the first electrode, and the metal oxide buffer layer directly adjoins the dielectric layer and the second electrode.

127. (Previously Added) The capacitor of claim 1, wherein the dielectric layer comprises a single layer.